

ArevaEPRDCPEm Resource

From: WILLIFORD Dennis (AREVA) [Dennis.Williford@areva.com]
Sent: Wednesday, April 11, 2012 10:17 AM
To: Tesfaye, Getachew
Cc: BENNETT Kathy (AREVA); DELANO Karen (AREVA); ROMINE Judy (AREVA); RYAN Tom (AREVA); KOWALSKI David (AREVA)
Subject: Response to U.S. EPR Design Certification Application RAI No. 536 (6260), FSAR Ch. 9, Supplement 1
Attachments: RAI 536 Supplement 1 Response US EPR DC.pdf

Getachew,

AREVA NP Inc. provided a schedule for a technically correct and complete response to the question in RAI No. 536 on February 6, 2012.

The attached file, "RAI 536 Supplement 1 Response US EPR DC.pdf" provides a technically correct and complete final response to Question 09.01.04-41.

The following table indicates the respective pages in the response document, "RAI 536 Supplement 1 Response US EPR DC.pdf," that contain AREVA NP's response to the subject question.

Question #	Start Page	End Page
RAI 536 — 09.01.04-41	2	3

This concludes the formal AREVA NP response to RAI 536, and there are no questions from this RAI for which AREVA NP has not provided responses.

Sincerely,

Dennis Williford, P.E.
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.

7207 IBM Drive, Mail Code CLT 2B
Charlotte, NC 28262
Phone: 704-805-2223
Email: Dennis.Williford@areva.com

From: WILLIFORD Dennis (RS/NB)
Sent: Monday, February 06, 2012 6:23 PM
To: Tesfaye, Getachew
Cc: BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB); KOWALSKI David (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 536 (6260), FSAR Ch. 9

Getachew,

Attached please find AREVA NP Inc.'s response to the subject request for additional information (RAI). The attached file, "RAI 536 Response US EPR DC.pdf," provides a schedule since a technically correct and complete response to the one question cannot be provided at this time.

The following table indicates the respective pages in the response document, "RAI 536 Response US EPR DC.pdf," that contain AREVA NP's response to the subject question.

Question #	Start Page	End Page
RAI 536 — 09.01.04-41	2	2

The schedule for a technically correct and complete response to the question is provided below.

Question #	Response Date
RAI 536 — 09.01.04-41	April 11, 2012

Sincerely,

Dennis Williford, P.E.
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.

7207 IBM Drive, Mail Code CLT 2B
Charlotte, NC 28262
Phone: 704-805-2223
Email: Dennis.Williford@areva.com

From: Tesfaye, Getachew [<mailto:Getachew.Tesfaye@nrc.gov>]
Sent: Wednesday, January 04, 2012 6:55 PM
To: ZZ-DL-A-USEPR-DL
Cc: Jenkins, Joel; Terao, David; Hearn, Peter; Segala, John; ArevaEPRDCPEm Resource
Subject: U.S. EPR Design Certification Application RAI No. 536 (6260), FSAR Ch. 9

Attached please find the subject request for additional information (RAI). A draft of the RAI was provided to you on December 23, 2011, and on January 4, 2012, you informed us that the RAI is clear and no further clarification is needed. As a result, no change is made to the draft RAI. The schedule we have established for review of your application assumes technically correct and complete responses within 30 days of receipt of RAIs. For any RAIs that cannot be answered within 30 days, it is expected that a date for receipt of this information will be provided to the staff within the 30 day period so that the staff can assess how this information will impact the published schedule.

Thanks,
Getachew Tesfaye
Sr. Project Manager
NRO/DNRL/LB1
(301) 415-3361

Hearing Identifier: AREVA_EPR_DC_RAIs
Email Number: 3871

Mail Envelope Properties (2FBE1051AEB2E748A0F98DF9EEE5A5D4BEDEF3)

Subject: Response to U.S. EPR Design Certification Application RAI No. 536 (6260),
FSAR Ch. 9, Supplement 1
Sent Date: 4/11/2012 10:16:59 AM
Received Date: 4/11/2012 10:14:47 AM
From: WILLIFORD Dennis (AREVA)

Created By: Dennis.Williford@areva.com

Recipients:
"BENNETT Kathy (AREVA)" <Kathy.Bennett@areva.com>
Tracking Status: None
"DELANO Karen (AREVA)" <Karen.Delano@areva.com>
Tracking Status: None
"ROMINE Judy (AREVA)" <Judy.Romine@areva.com>
Tracking Status: None
"RYAN Tom (AREVA)" <Tom.Ryan@areva.com>
Tracking Status: None
"KOWALSKI David (AREVA)" <David.Kowalski@areva.com>
Tracking Status: None
"Tsfaye, Getachew" <Getachew.Tsfaye@nrc.gov>
Tracking Status: None

Post Office: auscharm02.adom.ad.corp

Files	Size	Date & Time
MESSAGE	3504	4/11/2012 10:14:47 AM
RAI 536 Supplement 1 Response US EPR DC.pdf		64017

Options
Priority: Standard
Return Notification: No
Reply Requested: No
Sensitivity: Normal
Expiration Date:
Recipients Received:

Response to

Request for Additional Information No. 536(6260), Supplement 1

01/04/2012

U.S. EPR Standard Design Certification

AREVA NP Inc.

Docket No. 52-020

SRP Section: 09.01.04 - Light Load Handling System (Related to Refueling)

Application Section: 9.1.4

**QUESTIONS for Component Integrity, Performance, and Testing Branch 1 (AP1000/EPR
Projects) (CIB1)**

Question 09.01.04-41:**OPEN ITEM**

FSAR Section 3.8.3.1.1 states that a permanently installed cavity seal ring and neutron shield assembly rests on an embedded ring at the top of the wall, and is fabricated of stainless steel and radiation shielding material that bridges the annular gap between the reactor vessel and the vessel cavity concrete wall. The cavity seal is designed to meet the stress limits of ASME BPVC, Section III, Subsection ND. Seal and structural welds are made in accordance with ASME BPVC, Section IX and are examined in accordance with ASME BPVC, Section V.

The response from AREVA to RAI 337, Question 09.01.04-14, changes the name of the seal to “ring,” and describes the reactor vessel cavity ring as a permanently installed stainless steel assembly welded to the reactor vessel and a support structure embedded in the reactor building concrete. It clarifies that this cavity ring is a mechanical component designed in accordance with ASME Section III, Subsection ND. Base metal and weld materials are consistent with specifications in ASME BPVC Section II. Welding procedures and welders are qualified in accordance with ASME BPVC Section IX. Welds are examined in accordance with ASME BPVC, Section V. It also includes Figure 09.01.04-14-1 showing the reactor cavity ring arrangement.

Based on these elements, especially from the Figure 09.01.04-14-1, the staff deduced that some parts of the cavity ring assembly are welded to the reactor vessel. However, the staff was not able to identify precisely which ones and how they are attached to the reactor vessel; therefore, it is not clear to the staff how the cavity ring assembly could affect the reactor vessel material and integrity.

Because of the interfaces between the cavity ring assembly and the reactor vessel, the staff requests the applicant provide the following information to assure that this ring assembly will not adversely impact the materials and integrity of the reactor vessel (e.g., to behave in a brittle manner or increase the probability of rapidly propagating failure):

- a. Describe in detail the permanent refueling cavity ring assembly, including the identification of the materials that are used;
- b. Identify any fasteners or welds used in the cavity ring assembly;
- c. Describe in detail the connections between the cavity ring assembly and the reactor vessel, particularly with the reactor vessel pressure retaining portion. If welding is used, describe any design considerations (such as weld joint type or location) or controls on welding (such as weld size or heat input limitations) that assure that welding has no adverse impact on the reactor vessel material and integrity.

Response to Question 09.01.04-41:

- a. The cavity seal ring is a continuous Type 304 stainless steel membrane. Refer to Figure 09.01.04-14-1—Permanent RPV Refueling Cavity Ring – General Configuration, which is contained in the Response to RAI 337, Question 09.01.04-14. The nominal thickness of the membrane is 2 mm (approximately 0.08 in). The membrane is seal welded with fillet welds to a nonstructural attachment of the reactor vessel and to a structure embedded in

the reactor cavity floor. The inverted “U” shape of the membrane provides flexibility of the membrane to accommodate temperature and pressure growth of the reactor vessel.

- b. There are no fasteners used in either the construction of the cavity seal membrane or in the installation of any connections that are relied upon to maintain the cavity seal. There are some leveling screws on the embedded structure used during installation, but these do not perform an in-service function and are not relied upon to maintain the cavity seal. As stated in the response to Part (a), the membrane is continuous and is welded to a nonstructural attachment of the reactor vessel and to a structure embedded in the floor. All installation welding is performed using ASME Section IX-qualified procedures and personnel. These welds will be subjected to liquid penetrant examination performed in accordance with ASME Section V and with acceptance criteria per ND-5000 of ASME Section III.
- c. As stated in the response to Part (a), the cavity seal ring membrane is welded to a nonstructural attachment of the reactor vessel and is not attached to pressure retaining material. Referring to Figure 09.01.04-14-1, the portion of the reactor vessel to which the membrane is welded is a carbon steel ring that sits on a ledge machined on the outside of the reactor vessel. The top of the nonstructural attachment is clad with austenitic stainless steel weld material. The only welded connection between the nonstructural attachment and the pressure retaining portion of the reactor vessel itself is a seal weld between the cladding on the ring and the cladding on the mating face of the reactor vessel. Therefore, the cavity seal ring weld seal weld is outside of ASME Section III jurisdiction and poses no risk to the integrity of the reactor vessel.

FSAR Impact:

The U.S. EPR FSAR will not be changed as a result of this question.